A

Amortized Total Capital Cost ($/yr): The total capital cost amortized at an 8% discount rate for the life of the treatment systems. System life is assumed to be 10 years for removal technologies (such as Vapor Phase Adsorption) and 5 years for destruction technologies (such as Alkali Bed Reactor, Catalytic Thermal Oxidation, Plasma Destruction, Thermal Oxidation, and UV Oxidation). Total capital cost is the sum of equipment cost and the mobilization/demobilization cost.

Annual Operating Cost ($/yr): The annual cost incurred in the operation and maintenance of the treatment system. It includes the following cost elements as needed: utilities, fuel, hazardous wastes disposal, materials needed for caustic scrubbers, routine monitoring and maintenance, unscheduled maintenance, and supervision and project management costs.

Availability: The technology evaluation factor that indicates the availability of a technology system based upon the history of number of units deployed. See *Screening Matrix* for specific evaluation criteria.

B

C

Capital Cost ($): The cost of hardware and equipment. These costs were calculated in the cost model based upon quotes obtained from vendors for treating a 3,000-cfm gas stream containing 2,500 ppm of contaminants (60% CVOC, 40% VOC).

Capital Intensive: The technology evaluation factor that indicates whether or not a technology requires intensive capital investment relative to other technologies. See *Screening Matrix* for specific evaluation criteria.

Community Acceptance: The technology evaluation factor that indicates how a local community views a VOC off-gas treatment technology. Wide resistance of a community can hinder the implementation of a technology.

Contaminant Concentration (ppm): The concentration of contaminants in a gas stream measured as parts per million (ppm).

Contaminant Removed (lb): The mass of contaminants (measured or calculated in lb) in the inlet gas stream destroyed or removed by a treatment system.

Contaminants Treated: The range of contaminants in the gas stream effectively treated by a treatment system.

Conventional Technology: A technology that has been commercialized and used routinely by government and industry. Users recognized it as a mature treatment technology. This generally includes technologies that have gone through successful full-scale demonstrations and field implementations.

D

Demobilization ($): The cost required to disassemble the treatment system and transport it back to its original location. It is assumed in the cost model to be 150 technician hours at $37/hour and 20 engineer hours at $50/hour.

Design Flowrate (cfm): The flowrate (in cfm) of an inlet gas stream that a treatment system is designed to accommodate.

Destruction Removal Efficiency (DRE) (%): The gas stream contaminant destruction or removal efficiency of a technology. The DRE used in the cost model is an average DRE for the contaminants of concern. It is assumed that DREs for removal technologies are 98% maximum. There is no upper limit for destruction technologies.

Developing Technology: A technology that has gone through pilot-scale demonstration(s) and is at the stage of transitioning to full-scale demonstration/validation. The technology may or may not be commercialized and generally is not recognized by industrial users as a common treatment technology.

Development Status: A technology evaluation factor that indicates the developmental stage of a technology (i.e., emerging, innovative, or conventional).

E

Electrical Cost ($/kwhr): The cost of electricity consumption for a treatment system. The rate used in the cost model was obtained from PWC San Diego.

Emerging Technology: A technology that has gone through laboratory scale tests and is at the early stage of pilot-scale demonstration. More performance data are needed before it is ready for full-scale demonstration.

F

Flowfate (cfm): The volume of gas that flows through a device, a pipe, or a container.

Footprint (sq.ft./cfm): A technology evaluation factor that indicates land surface area required to house the equipment. It is expressed in square feet of surface area required per one cubic foot per minute of gas stream treated.

G

H

Haz Waste Generated: A technology evaluation factor that indicates the number of hazardous waste streams generated as a result of operating the off-gas treatment system.

I

Inlet Concentration Limit (%LEL): The limitation for contaminant concentrations in the inlet gas stream. Typical industrial practice is 25% of the lower explosive limit (LEL). A higher concentration stream is more likely to cause an explosion.

J

K

L

M

Management Cost ($/day): The costs incurred to perform the tasks of field supervision, project management, coordination with regulators, and scheduling.

Manifesting Cost ($/drum): The cost for disposal of hazardous wastes generated from the off-gas treatment system. It is expressed in dollars per a 55-gallon drum of hazardous waste. The rate used in the cost model is based upon the historical rate of a similar application at Site 9, NAS North Island.

Mobilization ($): The cost required for transportation, setup, and startup of the treatment system. The cost model assumes that all technologies are from the same local vicinity and have similar startup costs. It is assumed to be 300 technician hours at $37/hr and 40 engineer hours at $50/hour.

Monitoring and Preventative Maintenance ($/day): The cost of labor and materials needed to collect field samples, perform routine equipment inspection, and conduct equipment preventive maintenance.

N

Natural Gas Cost ($/therm): The cost of natural gas consumption for an off-gas treatment system. The rate used in the cost model was obtained from PWC San Diego.

Number Units Installed (#): The estimated number of system units deployed in field. This number was obtained from system vendors.

O

O&M Intensive: A technology evaluation factor that indicates whether or not a technology requires intensive operation and maintenance cost relative to other technologies. See *Screening Matrix* for specific evaluation criteria.

On-Site Utilities: A technology evaluation factor that indicates how many utilities are required by a treatment system or technology. A total of four utilities are considered in the technology evaluation matrix: electricity, gas, sewer, and water.

Operating Hours (hrs/day): The daily hours of operation for a treatment system. In the cost model, all systems are assumed to operate for 1 year, 16 hours/day, and 365 days/year.

P

pH Control Cost ($/day): The cost for neutralizing the acidic gas generated from a treatment system.

Q

R

Regulatory Compliance: A technology evaluation factor that indicates how many permits are required to operate a specific treatment system or technology.

S

Scale Up/Down: A technology evaluation factor that indicates the capability of a treatment system or technology to operate at off-designed flow conditions.

Sewer Cost ($/100 cu. ft.): The sanitary sewer disposal cost. The rate was obtained from PWC San Diego.

Size Threshold: An evaluation factor that indicates the flowrate capacity of a treatment system or technology.

Stream Concentration (ppm): The concentration of contaminants in a gas stream.

Subcomponents: The major components that comprise a treatment system, such as pumps, burners, blowers, and filters.

System: A specific configuration of a treatment technology. See *Treatment Technology*.

System Capacity (cfm): The inlet flowrate that a treatment system is designed to accommodate.

T

Technology Profile: A set of performance characteristics for a treatment technology.

Treatment Technology: The application of scientific and engineering principles, methodologies, and techniques for the purpose of remediating contaminated media. In the context of this database, a *technology* is a general treatment methodology, whereas a *system* is a more specific (usually vendor specific) configuration of the general methodology.

Typical Unit Cost ($ per lb. of contaminant removed): The estimated unit treatment cost calculated by the cost model for a pre-defined set of inlet gas stream conditions.

U

Unit Cost Range ($ per lb. of contaminant removed): The estimated lower and upper range of the treatment system unit cost. The range varies for treatment of a gas stream of 3,000 cfm / 2,000 ppm (less expensive) to that of 1,000 cfm / 500 ppm (more expensive).

Unscheduled Maintenance ($/day): The cost for conducting maintenance on equipment due to unexpected system problems.

V

W

Water Cost ($/100 cu. ft.): The cost of water consumption for the treatment system. The rate used in the cost model was obtained from PWC San Diego.

X

Y

Z